AMENDMENTS TO THE CLAIMS

Claims 1-9 (canceled)

10. (new) An apparatus for preloading a torsion bar comprising:

an adjustment nut adapted to be rigidly attached to a support member;

an adjustment bolt threadably engaged in the adjustment nut, having a free end, and having a longitudinal axis; and

an adjuster arm adapted to be attached to and extend radially from the torsion bar and have a free end including an involute surface formed thereon that is defined by an evolute circle and extends over a predetermined adjustment range of contact, the involute surface being in contact with the free end of the adjustment bolt and perpendicular to the longitudinal axis of the adjustment bolt at any point of contact between the involute surface and free end of the adjustment bolt within the adjustment range of contact.

11. (new) The apparatus of claim 10 wherein the adjuster arm has a center of rotation and the evolute circle is defined by an equation $(xc+R)^2+(yc)^2=R^2$, where xc is an X-axis distance of a point of contact, within the adjustment range of contact, between the adjustment bolt and the involute surface from a nominal position point of contact, yc is a Y-axis distance of the point of contact, within the adjustment range of contact, between the adjustment bolt and the involute surface from the nominal position point of contact, and R is a radius of the evolute circle that has a center at the center of rotation of the adjuster arm.

12. (new) The apparatus of claim 10 wherein the adjuster arm has a center of rotation and the involute surface is defined by a first equation $x(t)=R*(\cos(t)+t*\sin(t)-1)$ and a second equation $y(t)=R*(\sin(t)-t*\cos(t))$, where R is a distance from the center of rotation to a nominal position point of contact between the adjustment bolt and the involute surface, t is an angle of rotation of the adjuster arm from the nominal position point of contact to a point of contact within the adjustment

range of contact, x(t) is an X-axis distance of the point of contact between the adjustment bolt and the involute surface from the nominal position point of contact as a function of t, and y(t) is a Y-axis distance of the point of contact between the adjustment bolt and the involute surface from the nominal position point of contact as a function of t.

13. (new) The apparatus of claim 10 wherein the free end of the adjustment bolt includes a tapered surface for contact with the involute surface.

14. (new) An apparatus for preloading a torsion bar comprising:

an adjustment nut adapted to be rigidly attached to a support member;

an adjustment bolt threadably engaged in the adjustment nut, having a free end, and having a longitudinal axis; and

an adjuster arm adapted to be attached to and extend radially from the torsion bar, having a center of rotation, and having a free end including a contact surface formed thereon that extends over a predetermined adjustment range of contact, is in contact with the free end of the adjustment bolt, and is defined by the following equation:

$$r = \frac{\int_a^b \sqrt{(x(t) - xd)^2 + (y(t) - yd)^2}\, dt}{b - a}$$, where r is a radius of curvature of the contact surface, t is an angle of rotation of the adjuster arm from a nominal position point of contact between the adjustment bolt and the involute surface to a point of contact within the adjustment range of contact, a and b are the limits of the angle of rotation t with $a \le t \le b$, xd is an X-axis coordinate of a center point of the arc defined by the radius r, yd is a Y-axis coordinate of the center point of the arc defined by the radius r, x(t) is an X-axis distance of the point of contact between the adjustment bolt and the contact surface from the nominal position point of contact as a function of t, and y(t) is a Y-axis distance of the point of contact between the adjustment bolt and the contact surface from the nominal position point of contact as a function of t.

15. (new) The apparatus of claim 14 wherein the contact surface is further defined by the equations: $xd = \frac{R(b-a+2\sin(a)-\sin(a-b)-2\sin(b))}{a-b+\sin(a-b)}$ and $yd = \frac{2R(\cos(b)-\cos(a))}{a-b+\sin(a-b)}$, where R is a distance from the center of rotation to the nominal position point of contact between the adjustment bolt and the contact surface.

16. (new) The apparatus of claim 14 wherein the free end of the adjustment bolt includes a tapered surface for contact with the contact surface.

17. (new) A torsion bar adjustment mechanism for applying and adjusting a preload in an automotive suspension system, the adjustment mechanism comprising:

a torsion bar having an end;

a support member;

an adjustment nut rigidly attached to the support member;

an adjustment bolt threadably engaged in the adjustment nut, having a free end, and having a longitudinal axis; and

an adjuster arm attached to the end of and extending radially from the torsion bar, having a center of rotation, and having a free end including a contact surface formed thereon that extends over a predetermined adjustment range of contact, is in contact with the free end of the adjustment bolt, and is defined by the following equation:

$r = \frac{\int_a^b \sqrt{(x(t)-xd)^2+(y(t)-yd)^2}\,dt}{b-a}$, where r is a radius of curvature of the contact surface, t is an angle of rotation of the adjuster arm from a nominal position point of contact between the adjustment bolt and the involute surface to a point of contact within the adjustment range of contact, a and b are the limits of the angle of rotation t with $a \le t \le b$, xd is an X-axis coordinate of a center point of the arc defined by the radius r, yd is a Y-axis coordinate of the center point of the arc defined by the radius r, x(t) is an X-axis distance of the point of contact between the adjustment bolt and the contact surface from the nominal position point of contact as a function of t, and y(t) is a Y-axis distance

of the point of contact between the adjustment bolt and the contact surface from the nominal position point of contact as a function of t.

18. (new) The apparatus of claim 17 wherein the contact surface is further defined by the equations: $xd = \frac{R(b-a+2\sin(a)-\sin(a-b)-2\sin(b))}{a-b+\sin(a-b)}$ and

$yd = \frac{2R(\cos(b)-\cos(a))}{a-b+\sin(a-b)}$, where R is a distance from the center of rotation to the nominal position point of contact between the adjustment bolt and the contact surface.